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When our committee submitted a list of objectives for high school biology to one of our colleagues for criticism, he commented in the margin, "Making objectives has been a favorite indoor sport of educators for a number of years; but attaining the objectives is a different species of animal!"

From the outset of our investigation we have been aware that we could contribute very little to science teaching by producing a better set of aims or objectives. We know that for a long time teachers with good objectives have taught poor biology, while other teachers with the same objectives—or with none at all on paper—have taught good biology. Yet our first task, we felt, was to agree on the specific things which we believed should be accomplished in the high school course in natural science. The sad truth is, many of us teach without regard for the objectives which we have set up. Lesson plans are dictated by the expediency of over-crowded teaching schedules. We make our progress tests on items which are easy to test—whether we believe in their importance or not; and *they* become our objectives. It is much easier to ask students to name the enzymes of gastric juice than to determine whether they can use the principles of digestion for their own welfare.

So our committee made out a preliminary list of objectives against which we would check the subject matter of our course. We feel that if any bit of subject matter does not contribute to one of our aims, then it does not belong in our course of study. And I believe I should add right now that we do not think of high school biology as a prerequisite for college biology. This point might be labored at length, but in brief we feel that our attitude is justified by the small percentage of our students who attend college and by our belief that college biology is not planned around a high school prerequisite in natural science.[1]

In a great many schools the biology course is a highly diluted form of college biology which does little to prepare the student for college and still less to prepare him for life itself. I suppose the primary reason for this is that so many high school teachers are trained in courses which are definitely planned as prerequisites for more advanced courses in biological science. During the past ten or fifteen years the writers of our texts have helped to make biology more functional. That is, I think it is easier with modern books to teach so the students can make immediate use of what they learn—though it is still tempting to teach words instead of concepts, definitions instead of understandings and applications.

[1]For a recent discussion of the diversity found in college biology courses see Gordon Alexander, "The Integrated College Course in General Biology", THE AMERICAN BIOLOGY TEACHER, 9:183-186, March 1947.

The difference between good and poor biology teaching is just a difference in what the students are *doing* for an hour or so each day for about 180 days. If they are memorizing lists of terms which have no particular connection with their own lives; if they are neatly tracing a sketch of the human skeleton to get a grade; if they are cutting through the mid-dorsal line of an earthworm to fill a blank space on a lab manual; if they are sitting there day after day reading pages; or if they are just sitting there day after day . . . then it is not likely that their lives are much better for having one credit in biology.

Our committee feels that a course of study can best serve biology teachers by emphasizing the activities and problems which can be supervised without requiring excessive daily preparation for the teacher. It should suggest things which the students should be *doing*. It should be flexible enough that our suggestions can be adapted to different textbooks and to different unit sequences. Incidentally, we have come up against the problem time and again of getting our units into logical seasonal sequence and still maintain psychological continuity. Some texts would have us study seed germination in October and the anatomy of grasshoppers in February. Biology should be a study of *living* things, so far as possible in their natural environments.

One way in which we hope to make our outline flexible yet provide continuity is to preface our series of basic units by a number of briefer study topics for which seasonal treament is important. Such topics as bird migration, spring flowers, game laws, gardening, winter adaptations, etc., may be fitted in with basic units with which they are most closely related. But the advantage of studying these topics during the most appropriate season may justify interruptions in the basic units. Some topics may even be sandwiched in with unrelated material on a part-time basis. In placing these topics before rather than after the basic units, we hope to avoid the impression that they are "extras" to be used only if time remains at the end of the course.

Since my purpose right now is not so much to report on our "progress" as to take back to the committee your comments and suggestions I am going to cut this short by mentioning a few of our ideas on which your comment may be most helpful:

The study of phylogenetic relationships should be limited to those which contribute to an understanding of heredity, the development of the individual, and the scheme of classification.

Such topics as sex education and conservation can best be taught by repeated and continuous applications throughout the course rather than as subjects of special units alone.

The study of hormones and vitamins should be stressed with respect to their normal metabolic activities rather than with respect to abnormalities.

Technical terminology should be reduced to a minimum; and

where technical terms are necessary they should be taught as useful tools of learning and not as ends in themselves.

A course in geology should be a part of the training of biology teachers.

In order to take advantage of review and repetition and their effect on final understanding, many topics should be repeated during the course, with continuity and increasing difficulty.

If any of you have suggestions which cannot be fitted into our time limits this afternoon, we will appreciate your sending them to any member of the committee. They are as follows: Myra G. Willis, chairmaan, of Wilson High School, Cedar Rapids; Clifford O. Johnson, writer, Senior High School, Dubuque; Willard Unsicker, University High School, Iowa City; Albert Potter, Campus School, Cedar Falls; and Richard F. Trump, Senior High School, Ames.

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